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# Weed Control in Established Alfalfa and Other Forage Legumes

Minnesota has approximately three million acres of alfalfa, alfalfa-grass mixtures, or other forage legumes that are used primarily as livestock feed. Approximately one-third of these "hay-crop" acres are reestablished each year, partly because weeds take over and the stands become unproductive or produce low quality feed. Controlling weeds in forage crops does not always increase total dry matter production; however, most weeds are less palatable and provide a less dependable feed supply than adapted forage species. Controlling weeds usually results in improved forage quality and higher protein levels if good forage production practices also are used. Weed control also may prolong the productive life of the alfalfa stand by preventing competitive weeds such as quackgrass from crowding out the alfalfa.

Alfalfa often has been suggested as a rotational crop to help control certain problem weeds. Established stands of forage legumes can compete effeectively with many weeds. If alfalfa is to compete well with weeds, however, it is important to establish a stand of at least 20 plants per square foot in the seedling year by using effective establishment practices. Then good management practices should be followed to maintain a competitive forage stand.

Many weeds in established legumes can be controlled by harvesting the crop before the weeds flower in order to prevent weed seed formation and dispersal. If weeds "go to seed" before the legume is ready for harvest, the forage should be ensiled, if possible. Fermentation in the silo kills many weed seeds.

### Cultural Practices for Weed Control in Forages

1. Before seeding alfalfa or other forage legumes, apply lime and fertilizer according to soil test needs.
2. Seed adapted varieties at the proper depth into a firm, level seed bed to help ensure good germination and seedling survival.
3. Use a timely and proven method of forage legume seeding and establishment. Direct seeding in the spring with an herbicide(s) or in the late summer without an herbicide has produced better legume stands than spring seeding with a companion crop.
4. Maintain a cutting/grazing schedule that allows adequate regrowth and recovery of the stand, consistent with the need for harvesting good quality forage.

### Herbicides for Weed Control in Established Forage Legumes

Many of the biennial or perennial broadleaf weeds that are troublesome in alfalfa are deep rooted and similar to alfalfa in growth habit. These weeds are difficult to control with herbicides without injury to the alfalfa. On the other hand, quackgrass and other grass weeds that invade alfalfa are shallow rooted and are morphologically different enough from alfalfa so that control with herbicides is more feasible. However, the herbicides that control quackgrass also injure or kill most perennial forage grasses as well as the weedy grasses.

There is a rather limited number of herbicides available to control weeds in established alfalfa (table 1). These are simazine (Princep), metribuzin (Sencor/Lexone), terbacil (Sinbar), pronamide (Kerb), 2,4-DB (Butyrac, Butoxone), and certain formulations of MCPA. All of these except 2,4-DB are cleared for use only when the alfalfa is dormant or after the last cutting in the fall (see table 1) and all may cause alfalfa injury. Simazine should not be used on sands, loamy sands, or other coarse textured soils, or on soils where the soil pH is higher than 7.5. Metribuzin (Sencor/Lexone) may be used at varying rates on alfalfa/grass mixtures to control some broadleaf weeds and the amount of grass in the stand. Terbacil (Sinbar) should not be used on sand, loamy sand, gravely soils, or soils with less than 1 percent organic matter, or crop injury may result.

All three of these herbicides (simazine, metribuzin, and terbacil) should be used only on alfalfa stands established for at least one year. Pronamide (Kerb) will control annual grasses and suppress quackgrass the following year, when applied in fall, if soil moisture conditions are favorable. Some formulations of MCPA are cleared for fall application (when alfalfa is dormant) to control certain winter annual, biennial, or perennial weeds whose "winter rosettes" are still actively growing. There is considerable potential for alfalfa injury, however, 2,4-DB (Butyrac/Butoxone) is effective for control of only a few broadleaf weeds if applied when the weeds are small (one to three inches tall). 2,4-DB should be applied only when daytime temperatures range between 40° and 90° F.

Some troublesome perennial weeds cannot be adequately controlled with herbicides in established alfalfa or other forage legumes. Many of these weeds, however, can be controlled with glyphosate (Roundup), see table 2, prior to seeding the legumes.

For effective control, glyphosate must be applied as a spray on at least 6 to 8 inches of topgrowth of actively growing perennial weeds. The field may be tilled and seeded three or more days later. Because individual weed species differ in their response to various herbicides, the first step in effective weed control with herbicides is to identify the weed problem(s). Then select the best herbicide or herbicide combination to use (tables 1 and 2). Refer to and follow herbicide labels for more information.

**Table 1. Herbicides for weed control in established alfalfa and other forage legumes.**

| Crop(s) | Herbicide | Pounds per acre of active ingredient or acid equivalent broadcast | Time of application | Remarks | Environmental Protection Agency limitations on crop use |
|---|---|---|---|---|---|
| Alfalfa[1] | Simazine (Princep) | 0.8 to 1.6 | Fall, after last cutting. Prior to soil freeze-up. | May injure alfalfa. May carry over to injure next year's crop if other than corn. | Do not graze for 30 days or cut hay for 60 days after treatment. |
| Alfalfa[1] | Metribuzin (Sencor/Lexone) | 0.35 to 1.0 | Late fall or early spring when alfalfa is dormant. | May injure alfalfa. | Do not graze or harvest within 28 days of treatment. |
| Alfalfa[1] | Terbacil (Sinbar) | 0.25 to 0.75 | Late fall or early spring when alfalfa is dormant. | May injure alfalfa. Do not plant other crops within 2 years after treatment. | None |
| Alfalfa, clover, birdsfoot trefoil, or crownvetch | Pronamide (Kerb) | 1.0 to 2.0 | Fall, when soil temperatures are less than 60° F. but before freeze-up. | May injure alfalfa. | Do not graze or havest alfalfa within 25 to 45 days after treatment, depending on rate used. Do not graze or harvest other forage legumes for 120 days after treatment. See label. |
| Alfalfa | 2,4-DB amine | 0.5 to 1.5 | When annual broadleaf weeds are 1 to 3 inches tall (2 to 5 leaves). | May injure alfalfa. | Do not graze within 60 days or cut hay within 30 days of treatment. |
| Alfalfa | 2,4-DB ester | 0.5 to 1.0 | | May injure alfalfa. | |
| Alfalfa | MCPA[2] | 1/4 to 1/2 | Fall, after last cutting, when alfalfa is dormant. | Treat when temperatures are higher than 40° F. May injure alfalfa. | None |

[1] Alfalfa should be established for one year or more.
[2] Certain formulations only, see label.

**Table 2. Effectiveness of herbicides on major weeds in established alfalfa.[1]**

| | Simazine | Metribuzin | Terbacil | Pronamide | 2,4-DB | MCPA | Glyphosate |
|---|---|---|---|---|---|---|---|
| Alfalfa tolerance | F | F | F | G | F | P | N |
| Grasses | | | | | | | |
| Quackgrass | F | P | P | G | N | N | G |
| Wirestem muhly | F | P | P | G | N | N | G |
| Broadleafs | | | | | | | |
| White cockle | F | F | F | N | P | P | G |
| Hoary alyssum | F | P | P | N | P | P | G |
| Common dandelion | P | F | F | N | P | P | G |
| Curly dock | P | F | P | N | P | P | G |
| Yellow rocket | F | F | F | N | P | F | G |
| Field pennycress | G | G | G | P | G | G | G |
| Shepherd's-purse | G | G | G | P | G | G | G |
| Oxeye daisy | P | P | P | N | N | P | F |
| Narrowleaf hawksbeard | P | P | P | N | N | P | F |
| Orange hawkweed | P | P | P | N | N | P | F |
| Hempnettle | N | N | N | N | N | N | F |
| Hemp dogbane | P | P | P | N | N | P | F |
| Spotted knapweed | F | F | F | P | F | P | G |
| Virginia pepperweed | G | G | G | P | G | G | G |
| Perennial sowthistle | P | N | N | N | P | P | G |
| Tansy | N | N | N | N | N | N | F |
| Canada thistle | P | P | P | N | P | P | G |
| Bull thistle | F | F | F | P | F | F | G |

G = good, F = fair, P = poor, N = no control.
[1] Effectiveness ratings apply if herbicde is used according to label recommendations as to rate, time of application, etc., and if favorable temperature and moisture conditions prevail.


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